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(54) **Packaging arrangement for contact lenses**

Verpackung für Kontaktlinsen

Dispositif d'emballage pour lentilles de contact

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Description

[0001] The present invention relates to a packaging arrangement for the containment of at least one hydrophilic contact lens in a sterile aqueous solution. More specifically, the invention pertains to a packaging arrangement wherein a plurality of disposable hydrophilic contact lenses are contained in a specific number of individual packaging arrangements in the shape of blister packages which are adapted to be collectively housed in a suitable receptacle structure, such as a box-like container or carton so as to provide a specified or essentially requisite supply of contact lenses for use by a consumer over a predetermined period of time.

[0002] In particular, the invention is directed to the aspect of incorporating support structure in the form of stiffening rib or grooved wall elements to flanges of base members to facilitate an improved attachment between the base members of the blister packages housing the contact lenses, and a flexible cover sheet utilized for sealing engagement with the base members while incorporating additional strength to the blister package structures.

[0003] The packaging of hydrophilic contact lenses in a sterile aqueous solution is well known in the contact lens manufacturing technology. In particular, such packaging arrangements frequently consist of so-called blister packages which are employed for the storage and dispensing of the hydrophilic contact lenses by a medical practitioner or to consumer who intends to wear the contact lenses. Generally, such hydrophilic contact lenses, which may be disposable after a single wear or short-term use, are manufactured from suitable hydrophilic polymeric materials. These materials may be, amongst others, copolymers of hydroxyethyl methacrylate (HEMA) containing from about 20% to 90% or more of water, depending upon the polymer composition. Ordinarily, such contact lenses must be stored in a sterile aqueous solution, usually consisting of an isotonic saline solution, in order to prevent dehydration and to maintain the lenses in a ready-to-wear condition.

[0004] Heretofore, contact lens manufacturers normally utilized stoppered glass bottles containing sterile saline solutions into which the hydrophilic contact lenses were immersed, as storage and shipping containers for individual contact lenses. Each bottle was sealed with a suitable silicone stopper and provided with a metal closure as a safety seal in the configuration of an overcap. When the contact lens was intended to be removed from the bottle for use by a patient, the metal closure safety seal was required to be initially torn off the bottle, thereafter the stopper withdrawn and the lens lifted out from the bottle through the intermediary of a suitable plastic tweezer or pouring out of the contents. This entailed the need for the implementation of an extremely complicated procedure, since the contact lens was difficult to grasp and remove from the saline solution contained in the bottle due to the transparent nature of the

contact lens which rendered it practically invisible to or at least extremely difficult to ascertain by the human eye.

[0005] More recently, containments in the form of blister packages have been developed for hydrophilic contact lenses, and which enable the storage and shipping of the hydrophilic contact lenses in an expediently simple and inexpensive manner, while concurrently facilitating the conveniently easy removal of the contact lens by a medical practitioner or a patient.

[0006] For instance, a blister package which is adapted to provide a sterile sealed storage environment for a disposable or single-use hydrophilic contact lens, wherein the lens is immersed in a sterile aqueous solution, for example, such as in an isotonic saline solution, is described in U.S. Patent No. 4,691,820 to Martinez.

[0007] Thus, in the above-mentioned Martinez U.S. patent, the blister package for storing and dispensing a hydrophilic contact lens includes an injection-molded or thermoformed plastic base member incorporating a molded cavity which is surrounded by an outstanding planar flange about the rim of the cavity. A flexible cover sheet is adhered to the surface of the flange so as to sealingly enclose the cavity in a generally liquid-tight mode. Within the cavity of the base portion, a hydrophilic contact lens is immersed in a sterile aqueous solution, such as an isotonic saline solution. A portion of the side wall of the cavity is inclined to form a ramp extending upwardly towards the flange from the bottom of the cavity, and the cover sheet is adapted to be stripped from the flange in order to expose the cavity and inclined side wall thereof whereupon the lens may be readily manually removed by being slid upwardly and out of the cavity along the inclined ramp surface of the cavity.

[0008] Other embodiments of blister packages have the lens-containing cavity shaped to be of an essentially semi-spherical configuration which is dimensioned so as to be adapted to closely support the contact lens therein while immersed in an aqueous solution, for ease of removal and also to facilitate an inspection process. Moreover, the foregoing constructions primarily consider the utilization of such blister packages for the dispensing of individual contact lenses, with such blister packages being ordinarily separate or single packages such as those disclosed in US Patent No 5 409 104 to Ciba-Geigy Corporation, the disclosure of which forms the basis of the preamble of present claim 1, or interconnected arrays of blister packages, which may then be housed in larger quantities in further containments, such as a rigid cardboard or paperboard carton of usual construction as employed for the retail sale of the lenses; or possibly encased by a suitable shrinkwrap film.

[0009] It is an important commercial aspect to be able to furnish a user of such disposable hydrophilic contact lenses with a specific supply of contact lenses, the latter of which are normally worn for only a single day; in essence, for ordinarily 8 to 18 hours within a 24-hour pe-

riod and thereafter discarded. Hereby, the packaging of a supply of contact lenses should enable the user to store and provide indication for replenishing the supply of contact lenses at regular intervals; for example, at periods of 5, 10, 15, 30 days or even longer. Consequently, provision is made for packaging arrangements including specified quantities of such hydrophilic contact lenses contained in blister packages, such as being in suitable interconnected or loosely positioned arrays, wherein these packaging arrangements are adapted to be boxed in a carton enabling a rapid and precise determination as to the quantity of hydrophilic contact lenses contained therein, and with such packaging arrangements being of a compact nature which is completely protective of the hydrophilic lenses.

[0010] The present invention provides a packaging arrangement for the sealed containment of at least one hydrophilic contact lens in a sterile aqueous solution as defined in claim 1. The arrangement comprises at least one injection molded or thermo-formed plastic base member having a cavity for containing a contact lens immersed in said solution, said base member including a planar, rectangular flange extending outwardly about the periphery of the outer edge of said cavity, said cavity consisting of an indentation extending from the plane of the upper surface of said flange offset towards one end thereof, and a groove formed in the upper surface of said flange, projecting downwardly from a bottom surface of said flange closely inwardly of the peripheral edges of said flange and extending only about three sides of the flange.

[0011] In essence, the inventive concept pertains to packaging arrangements in which blister packages each possess a thermoformed or injection-molded base member which has a cavity containing respectively one hydrophilic contact lens in a sterile aqueous solution. A specified quantity of such blister packages may be the molded plastic base members thereof each containing a contact lens positioned in a contiguous array, and is initially covered by a preferably, although not necessarily, single flexible cover sheet which may be constituted of a laminated foil or other materials, such as metallized PET, PC to enhance barrier properties, or a layer of a suitable clear plastic laminate including a silicon oxide barrier layer to provide barrier properties against the transmission therethrough of oxygen, water, bacteria or the like, in order to provide a sealed environment for each of the contact lenses contained in the cavity formed in each base member. The flexible cover sheet may be dimensioned to cover a single base member to provide an individual or single packaging arrangement, or, in an alternative concept, may be in the form of strips whereby adjoining arrays or base members are severably interconnected to enable the dispensing of individual blister packages each containing one of the hydrophilic contact lenses as may be required by a user. In particular, a plurality of such arrays of packaging arrangements for contact lenses, which arrays or individ-

ual blister packages are adapted to be arranged in one or more containers.

[0012] Each of the blister package base members may possess a preferably substantially rectangular outstanding planar flange encompassing a respective contact lens-receiving cavity formed therein, the latter of which may be offset towards one end of the flange, and with the flange incorporating integral support structure formulating rigidly enhanced strength and compact packaging arrangements such that the cavities containing the hydrophilic contact lenses of superimposed arrays are substantially protected against potentially damaging external influences, such as shocks or impacts which may be imparted thereto during handling thereof.

[0013] Each molded plastic base member of a blister package may be constituted from a suitable injection-molded or thermoformed thermoplastic material, such as, or for instance, polypropylene, PET, PC and other thermoplastic materials; whereas the flexible cover sheet may be constituted of a foil or clear plastic laminate incorporating a barrier material, such as aluminum foil or silicon oxide as mentioned hereinabove, suitably imprinted and which is adapted to be heat-sealed to the flange of the base member extending about the cavity containing the hydrophilic contact lens in a sterile aqueous solution.

[0014] The multi-layered laminated foil includes an outer layer of a plastic film material of a suitable polyolefin, preferably but not necessarily polyester, which is adhesively bonded to the surface of a supporting metallic foil, which may consist of aluminum, and in which the outer layer is double-sided printed; in effect, on both opposite surfaces thereof. The surface of the outer plastic film layer which faces towards and is adhered to the metallic foil is imprinted with suitable indicia and legends which may consist of permanent information regarding the manufacturer and the product, logos, instructive material, and decorative and advertising indicia relative the product in the blister package; whereas the opposite or exterior surface of the outer plastic film material layer may include suitable changeable information, such as expiration dates, lot numbers, fitting parameter, and other data specific to the packaged product. The interior surface of the outer plastic film material layer may be imprinted through the intermediary of suitable lithographic printing, either in single color or multi-colors and also provided with an appropriate printed background; whereas the changeable information specific to the product which is imprinted on specific areas of the outwardly facing surface of the outer film layer, may be printed thereon through thermal transfer printing. Adhered to the opposite surface of the metallic foil is a plastic film layer constituted of a polypropylene, which is adapted to be adhesively sealed to the base member of the blister package, which is also constituted of a compatible polypropylene composition.

[0015] In order to attain a stiffening or reinforcing effect for the base member, the base member as de-

scribed hereinbelow is equipped with a substantially peripheral downwardly extending depending wall in the form of a groove depending from the flange. The wall may comprise a continuous wall extending along at least a major extent of the flange surface. This, in essence, stiffening or reinforcing effect produced thereby enables the base member to be substantially stiffened or strengthened against deflection or distortion so as to enable appropriate application heat-sealing attachment of the flexible cover sheet thereto, thereby assuring proper sealing of the contents of the cavity, in effect, the contact lens which is immersed therein in the sterile aqueous solutions. The depending reinforcing wall, or in essence, the depending wall, may also serve as a locating structure for handling and/or manufacturing processes.

[0016] Pursuant to a specific feature of the invention, the base member is provided with a raised flange surface portion encompassing the contact lens-receiving cavity so as to ensure that at least the cavity is appropriately sealed by the flexible cover sheet, while enabling remaining portions of the flexible cover sheet which contact the other outwardly located flange surface areas to be selectively sealed thereto, or only loosely positioned thereon at various locations to provide a finger-engagable structure which facilitate peeling off and separation of the flexible cover sheet from the base member by a user when access is sought to the contact lens which is contained in the cavity of the base member.

[0017] Although the foregoing is described with regard to blister packages each having a base member containing a hydrophilic contact lens in an ordinarily semi-spherical cavity, the inventive structure is equally applicable to blister packages with base members having a cavity in the shape of a generally rectangular configuration with an upwardly sloping ramp surface as described in the above-mentioned U.S. Patent No. 4,691,820 to Martinez.

[0018] Pursuant to the present invention, the peripheral groove in the edge portion of the flange surface extending along a portion of the rectangular confines of the base member and forming a stiffening structure, concurrently enables the material of the flexible cover sheet to be pressed into engagement with the peripheral groove, thereby forming a sealing connection with the base member.

[0019] Accordingly, the present invention is directed to a novel construction of base members for blister packages each containing a cavity housing a hydrophilic contact lens immersed in an aqueous solution, whereby a depending stiffening or reinforcing wall portion extends downwardly from a flange of the base member along at least a portion of the peripheral extent thereof.

[0020] The present invention may also provide for the attaching of a flexible cover sheet to a flange portion of a base member for a blister package through effectuating a sealing engagement between the material of the flexible cover sheet and a raised surface structure in the flange portion of the base member for sealing enclosing

a contact lens-receiving cavity in the base member.

[0021] Reference may now be had to the following detailed description of exemplary embodiments of the invention, taken in conjunction with the accompanying drawings; in which:

Figure 1 illustrates certain aspects of a base member for a blister package pursuant to the invention; Figure 2 illustrates a bottom view of the base member of Figure 1;

Figure 3 illustrates a sectional view of the base member taken along line 3-3 in Figure 1;

Figure 4 illustrates an enlarged fragmentary view of the encircled portion A in Figure 3;

Figure 5 illustrates a top plan view of an embodiment of a base member for a blister package pursuant to the invention;

Figure 6 illustrates a bottom view of the base member of Figure 5;

Figure 7 illustrates a sectional view of the base member taken along line 7-7 in Figure 5;

Figure 8 illustrates an enlarged fragmentary view of the encircled portion A in Figure 7;

Figure 9 illustrates an enlarged fragmentary view of the encircled portion B in Figure 7;

Figure 10 illustrates certain additional aspects of a base member for a blister package pursuant to the invention;

Figure 11 illustrates a bottom view of the base member of Figure 10;

Figure 12 illustrates a sectional view of the base member taken along line 12-12 in Figure 10; and Figure 13 illustrates an enlarged fragmentary view of the encircled portion A in Figure 12.

[0022] Referring now in specific detail to the blister package construction, particularly as represented in Figures 1 to 4 of the drawings which embodiment is not in accordance with the present invention as claimed herewith, Figure 1 illustrates a top plan view of a base member 10 which is preferably constituted of an injection-molded or thermoformed plastic material, such as polypropylene. The base member 10 includes a planar and substantially rectangular flange 12 having elongate parallel side edges 14 and end edges 16, and whereby the generally rectangular flange 12 may have rounded end corners 18 as shown, although these end corners 18 may also be readily sharp or of chamfered configuration.

[0023] As illustrated in drawing Figures 3 and 4, a cavity 20 for receiving a single contact lens (not shown) in a sterile saline solution is formed in the flange 12, whereby the cavity may possess a generally hemispherical configuration, and is offset towards one end edge 16 of the planar flange 12, although equidistantly or centered between the side edges 14. A raised surface portion 22 of the upper planar surface 24 of the flange 12 surrounds the cavity 20, with an inner edge 26 of surface portion

22 being at a small distance radially outwardly thereof so as to form an annular raised flat or slightly convex plane relative to the remaining upper planar surface 24 of the rectangular flange 12.

[0024] Extending downwardly from the lower surface 28 of the rectangular flange 12 and closely inwardly offset with regard to the peripheral edges 14, 16 thereof is a depending rib or wall structure 30 which extends continuously within the entire perimeter of the rectangular flange 12. The depending wall structure or rib 30, which is integrally formed with the flange 12, is essentially a stiffening or reinforcing element imparting an enhanced rigidity and strength to the base member extending about the cavity 20. Moreover, the depending wall structure or rib 30 may serve as a locating feature during the handling and/or manufacture of the blister package.

[0025] Furthermore, the lower surface 28 of the flange 12 extending about the cavity may be provided with a small annular undercut 34 below raised surface portion 22, which may impart some degree of flexibility to the flange 12 relative to the cavity 20 containing the contact lens.

[0026] A flexible cover sheet 36, shown in phantom lines, which may be a foil or clear plastic laminate may be either adhesively fastened or heat-sealed to regions of the upper surface 24 of the flange and the raised surface portion 22 so as to seal the contact lens in the cavity 20, and may also be expediently heat-sealed to different upper surface areas of the flange 12. For instance, one edge of the flexible cover sheet 36 which extends towards one of the end edges 14, 16 of the flange 12 adjacent the cavity 20, may be loosely positioned externally of the circumferential raised surface 22 so as to provide a finger-gripping portion for a user attempting to peel the flexible cover sheet from the base member 10 while permitting the remaining essentially handle-shaped portion of the flange 12 formed between the cavity 20 and the distal end edge 16, as shown in Figure 3, to be held by the user while the flexible cover sheet 36 is being peeled away from the cavity 20, thereby enabling access to the contents therein; in effect, the contact lens.

[0027] With regard to the embodiment of a base member 40, as illustrated in Figures 5 to 9 of the drawings, in which elements which are similar to or identical with those in Figures 1 to 4 are identified by the same reference numerals, in this instance a generally flat and rectangular flange 12 of base member 40 has a cavity 42 for receiving a contact lens offset toward one end 16 thereof, while centered between side edges 14. The cavity 42 is configured whereby an upper portion 44 thereof extending into the upper planar surface 24 of the flange 12 is of a generally upwardly widening funnel-shaped or frusto-conical annulus which at its lower end 46 merges into a curvilinear or semi-spherical bottom 47. This may assist in rendering the withdrawal of the contact lens easier for a user. As in the blister package of Figures 1 to 4, the lens-receiving cavity 42 is at its

upper end encompassed by a raised annular surface portion 22 extending above the upper planar surface 24 of flange 12 and whereby the flexible cover sheet 36 may be adhesively heat-sealed thereto so as to sealingly enclose the cavity 42 while being sealed also to various other upper surface portions of the flange 12.

[0028] As illustrated in Figures 6 and 7, extending inwardly of and proximate to the side edges 14 and the one end edge 16 which is distant from cavity 42, is groove 48 in the upper planar surface 24 of flange 12 so as to define a "U" in which the legs thereof terminate proximate the exterior of cavity 42. This groove is required by the present invention as defined in the claims.

[0029] In transverse cross-section, as shown in the enlarged fragmentary detail in Figure 9, which represents encircled part "B" in Figure 7, the groove 48 is of a downwardly extending U-shape, so as to have the structure thereof form a reinforcing or stiffening wall element for the base member 40. If desired, portions of the cover sheet 36, when superimposed and adhesively or heat-sealingly fastened to the flange 12 may be pushed into the U-shaped groove 48 extending along the three sides of the flange, the opposite end where the flexible cover sheet 36 may extend beyond the annular raised surface portion 22 encompassing the cavity 42 may be loosely positioned on the flange 12 so as to provide a finger-gripping end for aiding a user in peeling the flexible cover sheet 36 off the base member 40.

[0030] The annular raised surface 22, as shown by insert A in Figure 7 and in enlarged detail in Figure 8 of the drawings, may have a flat or slightly convexly curved surface raised above the remaining upper surface 24 of the planar flange 12, so as to provide a good contact surface for heat-sealing the flexible cover sheet 36 thereto about the cavity 42.

[0031] Similarly, the groove 48 extending along the three edges of the planar flange 12, as more specifically illustrated in Figure 9, may be dimensioned so as to be able to receive tucked-in or pressed-in portions of the flexible cover sheet 36 in the event that such engagement is desired for retaining the flexible cover sheet to the base member of the complete blister package in that manner.

[0032] As illustrated in Figures 10 to 13, in which the construction of the base member 50 is quite similar to that of the base member 10 in the arrangement of Figures 1 to 4, whereby similar or identical elements are identified with the same reference numerals, the lens-receiving cavity 52 may be configured such that the curvilinear or semi-spherical portion 54 thereof extends at one end 56 into an upwardly inclined ramp 58 which is, in plan view, of a trough-like frusto-conically or tapered narrowing shape and has an outwardly curved or convex end surface 60 where it meets the flange 12. This inclined ramp 58 also forms an aid to a user enabling the easier removal of the contact lens from the cavity 52 by a smooth and reliable sliding method in the displacement of the lens upwardly along the ramp surface. The

peripheral dimensions of the contact lens-receiving cavity 52 and ramp 58 extend into a peripheral surface 62 which is raised above the upper surface 24 of flange 12, as shown in Figure 13, whereby the surface 62 may be flat or slightly convexly curved so as to enable heat-sealing of the flexible cover sheet 36 thereto, as indicated hereinbefore. The ramp 58 facilitates removal of the contact lens from cavity 52 upon peeling off of the cover sheet 36.

[0033] Also in this arrangement as in the arrangement of Figures 1 to 4, the planar flange 12 possesses a depending wall structure 30 extending about and within the entire perimeter thereof slightly inwardly of its peripheral edges 14, 16 so as to form a stiffening or reinforcing structure and locating feature as described hereinbefore. According to the present invention this depending wall would be in the form of a groove and would extend only about three sides of the flange.

[0034] While there has been shown and described what are considered to be a preferred embodiment and preferred features of the invention, it will, of course, be understood that various modifications and changes in form or detail could readily be made without departing from the scope of the invention.

Claims

1. A packaging arrangement for the sealed containment of at least one hydrophilic contact lens in a sterile aqueous solution, comprising at least one injection molded or thermoformed plastic base member (10;40) having a cavity (20;42;52) for containing a contact lens immersed in said solution, said base member (10;40) including a planar flange (12) extending outwardly about the periphery of the outer edge of said cavity (20;42;52), the cavity (20;42;52) in said molded plastic base member (10;40) being offset towards one end of said flange (12), said cavity (20;42;52) consisting of an indentation extending from the plane of the upper surface of said flange (12), **characterised in that** the packaging arrangement further comprises a groove (48) formed in the upper surface of said flange (12) and projecting downwardly from a bottom surface of said flange (12) closely inwardly of the peripheral edges (14,16) of said flange (12) and extending about at least portions of the periphery of said flange (12);

said flange (12) is rectangular; and

said groove (48) extends only about three sides of said flange (12) including an end edge (16) distant from said cavity (20;42;52) and two side edges (14), and terminating proximate said cavity (20;42;52).
2. The packaging arrangement of claim 1, wherein said groove (48) defines a U-shaped configuration.
3. The packaging arrangement of claim 1 or claim 2, wherein said groove (48) is U-shaped in transverse cross-section.
4. The packaging arrangement of any one of claims 1 to 3, wherein the upper surface (24) of said flange (12) has a raised surface area (22) extending about said cavity (20;42;52) for facing a superimposed cover sheet (36) in contacting relationship.
5. The packaging arrangement of claim 4, wherein said raised surface (22) is convexly curved in transverse cross-section.
6. The packaging arrangement of claim 4 or claim 5, wherein a seal is adapted to be formed between a superimposed cover sheet (36) and at least the raised surface (22) of said flange (12) sealingly extending about the periphery of said cavity (20;42;52).
7. The packaging arrangement of claim 6, wherein said seal comprises a heat seal.
8. The packaging arrangement of any preceding claim, wherein said groove (48) acts as a locating structure during handling and/or manufacturing processes.
9. The packaging arrangement of any preceding claim, wherein said groove (48) is integrally formed with said flange (12).
10. The packaging arrangement of any preceding claim, wherein said cavity (20;42;52) is generally hemispherical in shape.
11. The packaging arrangement of any preceding claim, wherein said cavity (52) has an upper portion (56) comprising an upwardly inclined ramp (58) having a trough-like section narrowing towards an upper end (60), and at a lower end extending into a semi-spherical bottom for said cavity (52).
12. The packaging arrangement of any one of claims 1 to 10, wherein said cavity (42) is generally hemispherical and includes an upwardly and outwardly inclined ramp portion extending to the upper surface of said flange (12).
13. The packaging arrangement of claim 12, wherein said ramp narrows along the upward incline thereof in a generally frusto-conical configuration.
14. The packaging arrangement of any preceding claim, wherein said plastic base member (10;40) is constituted of a thermoformable polymer, such as polypropylene.

15. The packaging arrangement of any preceding claim, further including a flexible cover sheet (36) superimposed over said base member (10;40) and dimensioned to be detachably sealed to upper surface areas of said flange (12) for sealingly enclosing said cavity (20;42;52).
16. The packaging arrangement of claim 15, wherein the flexible cover sheet (36) is pressed into engagement with the groove (48).
17. The packaging arrangement of claim 15 or 16, wherein said flexible cover sheet (36) has an expanse which is dimensioned to be within the confines of the periphery of said base member (10;40).
18. The packaging arrangement of claim 15, claim 16 or claim 17, wherein said flexible cover sheet (36) is dimensioned to interconnect a plurality of said base members (40) in a strip-like array for the containment of a specified number of said contact lenses arranged one in each cavity (20;42;52) of each of said base members (40).
19. The packaging arrangement of claim 18, wherein said flexible cover sheet (36) commonly extends over said plurality of base members (40) and is sealingly connected to each said flange (12) of respectively each said base member (10;40).
20. The packaging arrangement of claim 19, wherein said flexible cover sheet (36) is adapted to connect said plurality of base members (40) in a coplanar array.
21. The packaging arrangement of any one of claims 15 to 20, wherein said flexible cover sheet (36) has a substantially rectangular configuration.
22. The packaging arrangement of any one of claims 15 to 21, wherein said flexible cover sheet (36) is a multi-layered laminate having a layer of said laminate consisting of a thermoplastic film contacting upper surface portions of the flange (12) of said molded plastic base member (10;40).
23. The packaging arrangement of claim 22, wherein said flexible cover sheet (36) comprises a foil laminate.
24. The packaging arrangement of claim 22 or claim 23, wherein said flexible cover sheet (36) is transparent and comprises at least one silicon oxide barrier layer and a plurality of plastic layers.
25. The packaging arrangement of any one of claims 22 to 24, wherein said thermoplastic film is heat-sealed to said flange surface of the base member

(10;40) for sealing the cavity (20;42;52) containing the contact lens.

26. The packaging arrangement of any one of claims 15 to 25, wherein said base member (10;40) and said flexible cover sheet (36) conjointly form a moisture and vapor-imperviously sealed containment for said contact lens in said cavity (20;42;52).
27. The packaging arrangement of any one of claims 15 to 26, wherein said packaging arrangement comprises an individual blister package containing a single contact lens.

Patentansprüche

1. Verpackungsanordnung für die abgedichtete Einschließung von mindestens einer hydrophilen Kontaktlinse in einer sterilen wässrigen Lösung, umfassend mindestens ein spritzgußgeformtes oder thermogeformtes Kunststoff-Bodenteil (10;40), welches eine Aushöhlung (20;42;52) zur Aufnahme einer in die Lösung eingetauchten Kontaktlinse aufweist, wobei

das Bodenteil (10;40) einen planaren, sich um den Umfang der Außenkante der Aushöhlung (20;42;52) nach außen erstreckenden Flansch (12) aufweist und wobei die Aushöhlung (20;42;52) in dem geformten Kunststoff-Bodenteil (10;40) in Richtung eines Endes des Flansches (12) versetzt ist, wobei die Aushöhlung (20;42;52) aus einer Vertiefung besteht, die von der Ebene der Oberseite des Flansches (12) ausgeht, **dadurch gekennzeichnet, daß** die Verpackungsanordnung ferner eine Rille (48) umfaßt, die in der Oberseite des Flansches (12) ausgebildet ist und von einer Unterseite des Flansches (12) dicht innerhalb der Umfangskanten (14,16) des Flansches vorsteht und sich mindestens um Teile des Umfangs des Flansches (12) herum erstreckt;

daß der Flansch (12) rechteckig ist; und

daß die Rille (48) sich nur um drei Seiten des Flansches (12) erstreckt, welche eine Endkante (16), die entfernt von der Aushöhlung (20;42;52) ist, und zwei Seitenkanten (14) umfassen, und in der Nachbarschaft der Aushöhlung (20;42;52) endet.
2. Verpackungsanordnung nach Anspruch 1, wobei die Rille (48) eine U-förmige Anordnung definiert
3. Verpackungsanordnung nach Anspruch 1 oder 2, wobei die Rille (48) einen U-förmigen Querschnitt

aufweist.

4. Verpackungsanordnung nach einem der Ansprüche 1 bis 3, wobei die Oberseite (24) des Flansches (12) einen angehobenen Oberflächenteil (22) aufweist, der sich um die Aushöhlung (20;42;52) herum erstreckt und einem darübergelegten Deckblatt (36) zugewandt und in Kontakt mit diesem ist. 5
5. Verpackungsanordnung nach Anspruch 4, wobei die angehobene Oberfläche (22) in Querschnitt konvex gekrümmt ist. 10
6. Verpackungsanordnung nach Anspruch 4 oder 5, wobei eine Abdichtung zwischen einem darübergelegten Deckblatt (36) und mindestens der angehobenen Oberfläche (22) des Flansches (12) gebildet werden kann, die sich abdichtend um den Umfang der Aushöhlung (20; 42; 52) erstreckt. 15
7. Verpackungsanordnung nach Anspruch 6, wobei die Abdichtung eine Hitzeverschweißung umfaßt. 20
8. Verpackungsanordnung nach einem der vorherigen Ansprüche, wobei die Rille (48) als Fixierungseinrichtung während der Handhabung und /oder des Herstellungsprozesses wirkt. 25
9. Verpackungsanordnung nach einem der vorherigen Ansprüche, wobei die Rille (48) integral mit dem Flansch (12) ausgebildet ist. 30
10. Verpackungsanordnung nach einem der vorherigen Ansprüche, wobei die Aushöhlung (20;42;52) im wesentlichen halbkugelförmig ist. 35
11. Verpackungsanordnung nach einem der vorherigen Ansprüche, wobei die Aushöhlung (52) einen oberen Teil (56) aufweist, der eine aufwärts geneigte Rampe (58) umfaßt, welche einen wannenartigen Abschnitt aufweist, der sich in Richtung auf ein oberes Ende (60) hin verengt und sich an einem niedrigeren Ende in einen halbkugelförmigen Boden der Aushöhlung (52) erstreckt. 40
12. Verpackungsanordnung nach einem der Ansprüche 1 bis 10, wobei die Aushöhlung (42) im wesentlichen halbkugelförmig ist und einen nach oben und auswärts ansteigenden Rampenteil aufweist, der sich zu der Oberseite des Flansches (12) erstreckt. 50
13. Verpackungsanordnung nach Anspruch 12, wobei sich die Rampe entlang deren Aufwärtsneigung in einer im wesentlichen kegelstumpfförmigen Anordnung verengt. 55
14. Verpackungsanordnung nach einem der vorherigen Ansprüche, wobei das Kunststoff-bodenteil (10;40)

aus einem thermoformbaren Polymer, wie Polypropylen, besteht.

15. Verpackungsanordnung nach einem der vorherigen Ansprüche, weiter einschließend ein flexibles Deckblatt (36), das über das Bodenteil (10;40) gelegt ist und so dimensioniert ist, daß es ablösbar mit oberen Teilen der Oberfläche des Flansches (12) versiegelt werden kann, um die Aushöhlung (20;42; 52) abdichtend zu umschließen. 5
16. Verpackungsanordnung nach Anspruch 15, wobei das flexible Deckblatt (36) in Verbindung mit der Rille (48) gepresst ist. 10
17. Verpackungsanordnung nach Anspruch 15 oder 16, wobei das flexible Deckblatt (36) eine Ausdehnung aufweist, die so dimensioniert ist, daß sie innerhalb der Umfangsbegrenzung des Bodenteils (10;40) liegt. 20
18. Verpackungsanordnung nach Anspruch 15, 16 oder 17, wobei das flexible Deckblatt (36) so dimensioniert ist, daß es eine Vielzahl von Bodenteilen (40) in einer streifenartigen Anordnung zur Einschließung einer bestimmten Anzahl von Kontaktlinien untereinander verbindet, von denen jeweils eine in jeder Aushöhlung (20;42;52) jeweils jedes Bodenteils (40) angeordnet ist. 25
19. Verpackungsanordnung nach Anspruch 18, wobei sich das flexible Deckblatt (36) gemeinsam über die Vielzahl von Bodenteilen (40) erstreckt und abdichtend mit jedem Flansch (12) jedes jeweiligen Bodenteils (10;40) verbunden ist. 30
20. Verpackungsanordnung nach Anspruch 19, wobei das flexible Deckblatt (36) angepaßt ist, um die Vielzahl der Bodenteile (40) in einer koplanaren Anordnung zu verbinden. 40
21. Verpackungsanordnung nach einem der Ansprüche 15 bis 20, wobei das flexible Deckblatt (36) eine im wesentlichen rechteckige Gestalt aufweist. 45
22. Verpackungsanordnung nach einem der Ansprüche 15 bis 21, wobei das flexible Deckblatt (36) ein mehrschichtiges Laminat ist, wobei eine Schicht des Laminats aus einem thermoplastischen Film besteht, welcher Teile der Oberseite des Flansches (12) des geformten Kunststoffbodenteils (10;40) berührt. 50
23. Verpackungsanordnung nach Anspruch 22, wobei das flexible Deckblatt (36) einen Folienschichtstoff umfaßt. 55
24. Verpackungsanordnung nach Anspruch 22 oder 23,

wobei das flexible Deckblatt (36) transparent ist und mindestens eine Siliziumoxid-Sperrschicht und eine Vielzahl von Kunststoffschichten aufweist.

25. Verpackungsanordnung nach einem der Ansprüche 22 bis 24, wobei der thermoplastische Film mit der Flanschoberfläche des Bodenteils (10;40) hitzeverschweißt ist, um die Aushöhlung (20;42;52), welche die Kontaktlinse enthält, abzudichten.
26. Verpackungsanordnung nach einem der Ansprüche 15 bis 25, wobei das Bodenteil (10;40) und das flexible Deckblatt (36) gemeinschaftlich eine feuchtigkeits- und dampfundurchlässig abgedichtete Einschließung der Kontaktlinse in der Aushöhlung (20; 42;52) bilden.
27. Verpackungsanordnung nach einem der Ansprüche 15 bis 26, wobei die Verpackungsanordnung eine individuelle Blisterverpackung umfaßt, die eine einzelne Kontaktlinse enthält.

Revendications

1. Dispositif d'emballage pour contenir de façon étanche au moins une lentille de contact hydrophile dans une solution aqueuse stérile, comprenant au moins un organe de base en matériau plastique moulé par injection ou thermoformé (10; 40) ayant une cavité (20 ; 42 ; 52) pour contenir une lentille de contact immergée dans ladite solution, ledit organe de base (10 ; 40) comprenant un rebord plan (12) s'étendant de façon extérieure autour de la périphérie du bord extérieur de ladite cavité (20 ; 42 ; 52), la cavité (20 ; 42 ; 52) dans ledit organe de base en plastique moulé (10 ; 40) étant décalée vers une extrémité dudit rebord (12), ladite cavité (20 ; 42 ; 52) étant constituée par un renforcement s'étendant depuis le plan de la surface supérieure dudit rebord (12), **caractérisé en ce que** le dispositif d'emballage comprend en outre une gorge (48) formée dans la surface supérieure dudit rebord (12), se projetant vers le bas à partir d'une surface inférieure dudit rebord (12) à proximité vers l'intérieur des bords périphériques (14, 16) dudit rebord (12) et s'étendant autour d'au moins des parties de la périphérie dudit rebord (12) ; **en ce que** ledit rebord (12) est rectangulaire et **en ce que** ladite gorge (48) s'étend seulement autour de trois côtés dudit rebord (12), y compris un bord d'extrémité (16) distant de ladite cavité (20 ; 42 ; 52) et deux bords latéraux (14), et se termine au plus près de ladite cavité (20 ; 42 ; 52).
2. Dispositif d'emballage selon la revendication 1, dans lequel ladite gorge (48) définit une configuration en forme de U.

3. Dispositif d'emballage selon la revendication 1 ou 2, dans lequel ladite gorge (48) est en forme de U en coupe transversale.
4. Dispositif d'emballage selon l'une quelconque des revendications 1 à 3, dans lequel la surface supérieure (24) dudit rebord (12) possède une région surélevée (22) s'étendant autour de ladite cavité (20 ; 42 ; 52) pour faire face à une feuille de couverture superposée (36) en relation de contact.
5. Dispositif d'emballage selon la revendication 4, dans lequel ladite région surélevée (22) est incurvée de façon convexe en coupe transversale.
6. Dispositif d'emballage selon la revendication 4 ou la revendication 5, dans lequel un scellement est destiné à être formé entre une feuille de couverture superposée (36) et au moins la région surélevée (22) dudit rebord (12), de façon à s'étendre de manière étanche autour de la périphérie de ladite cavité (20 ; 42 ; 52).
7. Dispositif d'emballage selon la revendication 6, dans lequel ledit scellement est constitué par un thermosoudage.
8. Dispositif d'emballage selon l'une quelconque revendication précédente, dans lequel ladite gorge (48) sert de structure de positionnement au cours d'opérations de manipulation et/ou de fabrication.
9. Dispositif d'emballage selon l'une quelconque revendication précédente, dans lequel ladite gorge (48) est formée intégralement avec ledit rebord (12).
10. Dispositif d'emballage selon l'une quelconque revendication précédente, dans lequel ladite cavité (20; 42 ; 52) est de forme généralement hémisphérique.
11. Dispositif d'emballage selon l'une quelconque revendication précédente, dans lequel ladite cavité (52) possède une partie supérieure (56) comprenant une rampe inclinée vers le haut (58) ayant une coupe analogue à une cuvette se rétrécissant vers une extrémité supérieure (60) et s'étendant, à une extrémité inférieure, en un fond hémisphérique de ladite cavité (52).
12. Dispositif d'emballage selon l'une quelconque revendication 1 à 10, dans lequel ladite cavité (42) est généralement hémisphérique et comprend une partie en rampe inclinée vers le haut et vers l'extérieur s'étendant jusqu'à la surface supérieure dudit rebord (12).

13. Dispositif d'emballage selon la revendication 12, dans lequel ladite rampe se rétrécit le long de la pente vers le haut de celle-ci en une configuration généralement tronconique.
14. Dispositif d'emballage selon l'une quelconque revendication précédente, dans lequel ledit organe de base en matériau plastique (10 ; 40) est constitué par un polymère thermoformable, tel que du polypropylène.
15. Dispositif d'emballage selon l'une quelconque revendication précédente, comprenant en outre une feuille de couverture souple (36) superposée audit organe de base (10 ; 40) et dimensionnée de façon à être scellée de manière amovible aux régions supérieure dudit rebord (12) pour fermer de façon étanche ladite cavité (20 ; 42 ; 52).
16. Dispositif d'emballage selon la revendication 15, dans lequel la feuille de couverture souple (36) est poussée au contact de la gorge (48).
17. Dispositif d'emballage selon la revendication 15 ou 16, dans lequel ladite feuille de couverture souple (36) présente une étendue dimensionnée de façon à être comprise à l'intérieur de la périphérie dudit organe de base (10 ; 40).
18. Dispositif d'emballage selon la revendication 15, 16 ou 17, dans lequel ladite feuille de couverture souple (36) est dimensionnée de façon à interconnecter une pluralité desdits organes de base (40) en un quadrillage en bande pour contenir un nombre spécifié desdites lentilles de contact, chacune d'elles étant disposée dans chaque cavité (20 ; 42 ; 52) de chacun desdits organes de base (40).
19. Dispositif d'emballage selon la revendication 18, dans lequel ladite feuille de couverture souple (36) s'étend de façon commune sur ladite pluralité d'organes de base (40) et est scellée à chaque rebord (12) de chaque organe de base (10 ; 40) respectif.
20. Dispositif d'emballage selon la revendication 19, dans lequel ladite feuille de couverture souple (36) est adaptée pour connecter ladite pluralité d'organes de base (40) en un quadrillage coplanaire.
21. Dispositif d'emballage selon l'une quelconque revendication 15 à 20, dans lequel ladite feuille de couverture souple (36) a une configuration sensiblement rectangulaire.
22. Dispositif d'emballage selon l'une quelconque des revendications 15 à 21, dans lequel ladite feuille de couverture souple (36) est un stratifié multi-couches dont une couche est constituée par un film thermoplastique venant au contact des parties de surface supérieures du rebord (12) dudit organe de base (10 ; 40) en matériau plastique moulé.
23. Dispositif d'emballage selon la revendication 22, dans lequel ladite feuille de couverture souple (36) est constituée par des feuilles laminées.
24. Dispositif d'emballage selon la revendication 22 ou la revendication 23, dans lequel ladite feuille de couverture souple (36) est transparente et comprend au moins une couche formant barrière d'oxyde de silicium et une pluralité de couches de matériau plastique.
25. Dispositif d'emballage selon l'une quelconque des revendications 22 à 24, dans lequel ledit film thermoplastique est thermosoudé à ladite surface du rebord de l'organe de base (10 ; 40) pour sceller la cavité (20 ; 42 ; 52) contenant la lentille de contact.
26. Dispositif d'emballage selon l'une quelconque des revendications 15 à 25, dans lequel ledit organe de base (10 ; 40) et ladite feuille de couverture souple (36) forment conjointement un récipient étanche imperméable à la vapeur et à l'humidité pour lesdites lentilles de contact dans ladite cavité (20 ; 42 ; 52).
27. Dispositif d'emballage selon l'une quelconque des revendications 15 à 26, dans lequel ledit dispositif d'emballage est constitué par un emballage soufflé individuel ou blister contenant une lentille de contact unique.

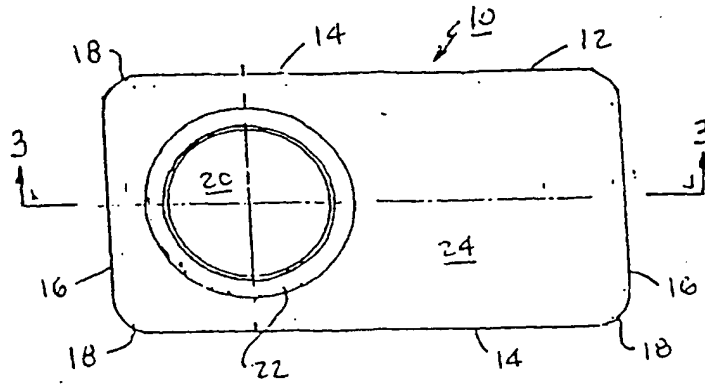


FIG. 1

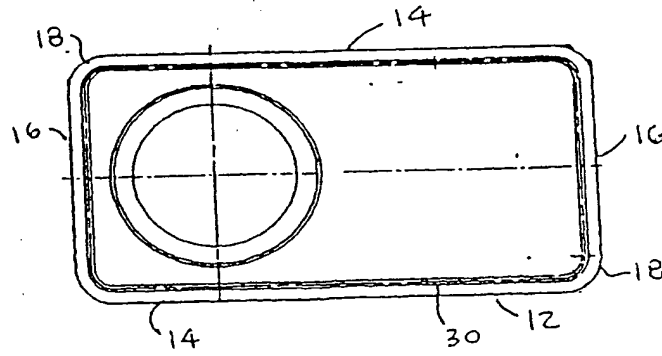


FIG. 2

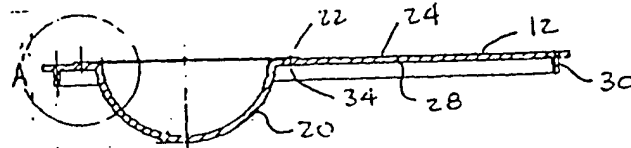


FIG. 3

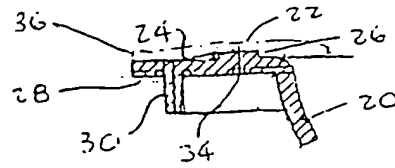
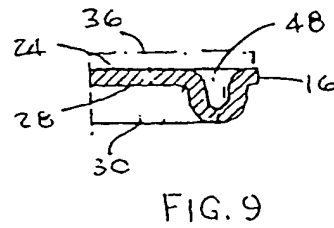
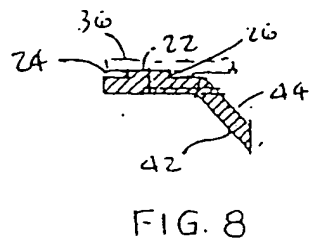
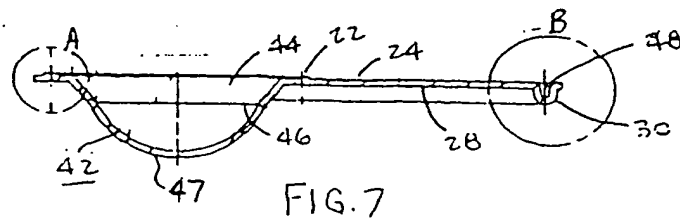
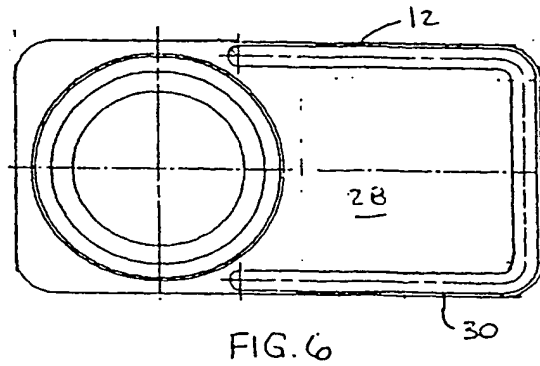
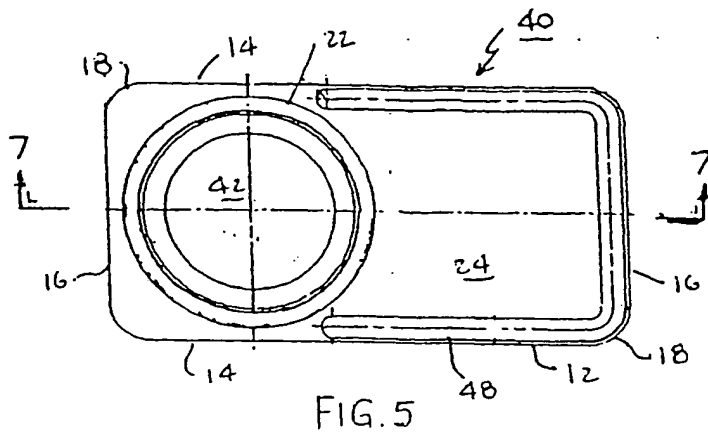
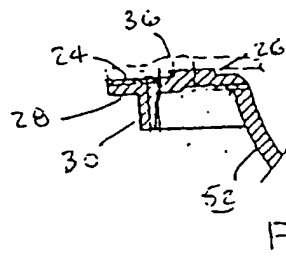
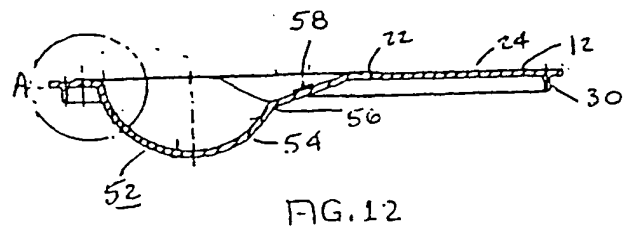
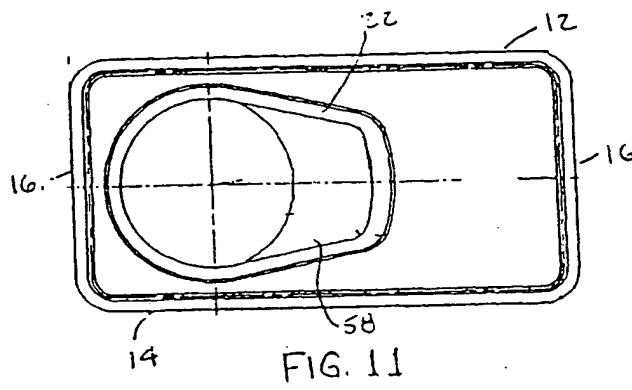
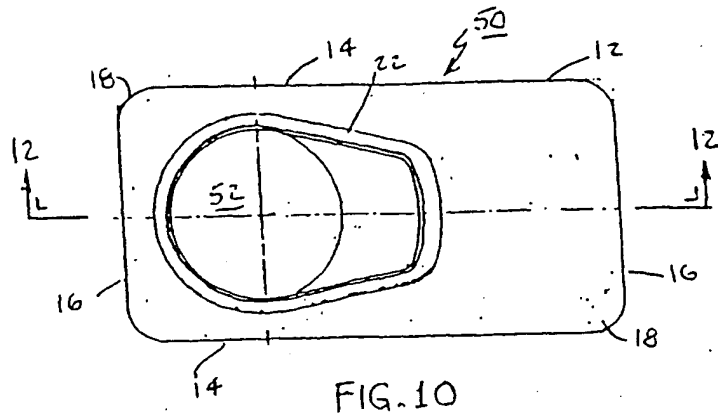


FIG. 4





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